SOME OBSERVATIONS ON FALL AND WINTER FOOD PATCHES FOR BIRDS IN SOUTHERN MICHIGAN

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For a number of years the Michigan Department of Conservation has taken an active interest in the testing of various grain-producing plants that might be useful in plantings to produce winter food for wildlife in Michigan. The data here presented result from two winters' study [1] of experimental plantings at the W. K. Kellogg Farm and Bird Sanctuary and the W. K. Kellogg Reforestation Tract near Battle Creek. Both areas are owned and operated by Michigan State College. This report deals only with the mechanics of winter food production. The need for winter food patches in southern Michigan will not be discussed.

Characteristics of a Good Food Plant

To best subserve the purpose for which it is intended a food patch plant must provide *an adequate and readily available supply of acceptable grain at the time when other foods are most scarce.* This means that fall flocks of migrant grackles or sparrows will not have eaten it. It means that the fruits must be persistent (that is, that the grain will remain on the stem). It means also that despite deep snow, high winds, or other weather conditions, the grain will be where birds can reach it. Of course it is essential that the food must be acceptable to the species for which it is intended.

Land that is available for wildlife plantings is usually that which is undesirable for agriculture. The best plant would be one that would grow in any type of soil under conditions of extreme dryness or wetness and produce a crop regardless of a good or poor growing season.

A Seed Mixture Recently Recommended for Wildlife

On the Williamston Coöperative Game Management Project[2] a mixture of crop seeds was developed for the purpose of providing winter food for wildlife (English, 1935). This mixture was recommended for several years by the Department and was quite widely used in Michigan and elsewhere. Following is a list of the seeds used in the mixture and the amounts of each per hundred pounds:

[1] In connection with graduate studies in vertebrate ecology.

[2] An Ingham County project (1931-1933) sponsored by the University of Michigan Department of Forestry and Conservation, the Michigan Department of Conservation, and other agencies.

Sudan grass	14.0 lbs.
Buckwheat	12.6 lbs.
Cowpeas, New Era	8.4 lbs.
Flax	8.4 lbs.
Hemp	8.4 lbs.
Corn, Golden Glow	7.7 lbs.
Millet, White Wonder	4.5 lbs.
Millet, Common	4.5 lbs.
Millet, Tennessee German	4.5 lbs.
Proso, Hog Millet	4.2 lbs.
Kaffir Corn (Milo Maize) or Sorghum, Early Amber	4.2 lbs.
Hegeri	4.2 lbs.
Soy Bean, Manchu	4.2 lbs.
Soy Bean, Ito San	4.2 lbs.
Feterite	3.2 lbs.
Sunflower, Mammoth Russian	2.8 lbs.

It was recommended that the mixture be scattered broadcast (about twenty pounds to the acre) and harrowed in. The seed bed was to be prepared as for corn.

It was desirable to learn whether the value of this type of food patch as originally indicated at Williamston would be borne out by further experimentation on other areas. Accordingly, as a part of a Department of Conservation wildlife research project, nine plots varying in size were planted on the Kellogg Farm in June, 1935. Two of these were on dry, sandy, upland areas considered undesirable for cultivated crops; six were on low ground of a moisture content varying with the different localities; one occupied a three-acre field of good agricultural land. The soil of the area is a sandy loam. The farm is a sanctuary but is considered to be submarginal from the standpoint of game birds. As the 1935 growing season was an excellent one it was a very good opportunity for this mixture to show what it would do under favorable climatic conditions on the best and poorest soils and situations of this area.

In the fall it was apparent that the amounts of grain produced by the various plots varied in a marked degree. Those in dry soil contained small quantities of buckwheat and millet. This soon disappeared, and as winter food patches they were of little consequence. In the other seven patches the plants grew well and each of them had a good crop of some of the grains. On low moist ground the hemp flourished, and on dryer soil buckwheat had the advantage. On the whole, the amounts of grain in the patches at this season were satisfactory.

Songbirds were very appreciative of the food patches. Flocks of migrant grackles visited them in September. Later the bulk of the

grain was taken by Tree Sparrows and juncos. At various times goldfinches, redpolls, chickadees, and siskins were found using the food.

By January hemp was all that remained in quantity. What millet and buckwheat was left in some patches was gone by the end of that month or was covered by snow. In February the snow reached a depth of twenty-six inches and almost nothing could be gleaned from the ground. In some of the patches hemp projected above the snow and in one instance was used by quail for several weeks.

Although pheasants were flushed from the patches at times during the fall, the food did not appear to have much attraction for them. This was due, doubtless, to the very large quantities of natural foods that had resulted from the bounteous season. There were very few records of the presence of pheasants in the food patches during the winter after snow came.

The results of similar experiments in 1936 were much the same. The very dry season, however, prevented more of the plots from producing in quantity. Plots on low, moist ground showed a good growth, but those on dry soils were very nearly a total loss. There was little snow during the following winter season and what grain remained, after the inroads of fall migrants, was available through April. However, as both quail and pheasants were, through movements, nearly absent from the 500-acre area, this winter provided a poor test of use by these species.

In summary:

1. The plants in the mixture grew well in *good* soils but not in poor ones.

2. On good and intermediate soils in a favorable growing season a good crop of grain was produced. In a dry season the crop was much reduced on all but very low situations.

3. The grain produced was used by songbirds in the fall, which greatly reduced the potential winter supply. Pheasants used the patches at times during fall and early winter but were not conspicuously attracted by them.

4. When snow was deep and other foods most scarce, the only food patch plant that was available was hemp, and only the well-watered plots on good soil offered this.

These experiments indicated that under favorable growing conditions the food patch mixture would produce a good variety and quantity of foods for granivorous birds in fall and early winter. However it is not well adapted to poor soils and dry situations, and evidently is not a dependable source of food for pheasants and quail in late winter emergencies.

Standing Corn

Corn is the one grain which needs little if any further trial. It is well known that unharvested corn will remain available throughout the winter. Both pheasants and quail will use it regularly and it provides more or less cover for the feeding birds. Songbirds will not exhaust the supply in the fall and yet a cornfield is an excellent place for them to feed. The ragweed (*Ambrosia elatior*), foxtail (*Setaria lutescens* and *S. viridis*), lamb's quarters (*Chenopodium album*), redroot (*Amaranthus retroflexus*), and other ruderals that grow among the corn furnish very good food for all ground-feeding birds as long as the supply lasts and snow is not deep.

On the Kellogg Reforestration Tract of Michigan State College a two-acre field was prepared in the spring of 1936 and planted to corn. In this very dry season the crop gave little promise of coming to maturity. August rains revived the plants, however, and although the average height of the corn was not over three feet, a surprisingly good crop resulted. The plot was not cultivated and gave rise to growths of foxtail and ragweed which added to the food supply. These two acres of corn and weeds, even though growing on very dry and rocky soil, constituted a good food patch. The yield would be considered very poor from the agricultural viewpoint, but was quite sufficient for the birds. We have little fear of error in unreservedly recommending corn as *the* plant patch plant, if and where winter food patches are wanted for quail and pheasants in southern Michigan.

Weed Patches

Any investigator into the food habits of winter birds is at once impressed with the high percentage of the fall and winter food of some species furnished by our most common garden weeds (Judd, 1898). Some of the most important have already been cited. The tremendous dependence that is placed upon the ragweed by songbirds, pheasants, and quail is probably not generally appreciated. Horned larks, quail, pheasants, and large flocks of Tree Sparrows, Song Sparrows, and juncos fed avidly upon ragweed at the Kellogg Farm in the winter of 1935-36. The disappearance of the flocks of songbirds from the area in February was correlated directly with the almost total exhaustion of the supply of what ragweed still protruded above snow level.

Ragweed, lamb's quarters, and tumbling pigweed (*Amaranthus graecizans*) are among the first plants to appear on newly broken soils in this locality. The reason for this is easily explained. In germination tests using random samples of Woburn barley soil, Brenchley

and Warington (1930) found 150 viable seeds of *Chenopodium album* per 8⅔ square feet. The weed seeds present in arable soils were clearly demonstrated in this work. That weed seeds are present even in soil long covered by sod was shown by Chippindale and Milton (1934). It was found that in the soils of pasture lands there is often little "relationship between the vegetation of the area and the seed flora of the soil". Any disturbance of the soil serves immediately to increase the numbers of common annual weeds. They further state, "It is clear that were the existing sward to be destroyed the flora of this field would immediately become typical of arable land." Among the seeds commonly found were those of *Prunella*, *Chenopodium*, *Polygonum*, *Rumex*, *Plantago*, and *Trifolium*. Although this work was done in England, we find all of these genera represented in Michigan and plants belonging to at least five of them produce food used by winter birds. If similar work were done here, ragweed "seeds" undoubtedly would be found to be present. An experiment started by W. J. Beal in 1879 and continued by H. T. Darlington indicated that seeds of some of the common weeds may remain buried and viable for at least fifty years (Darlington, 1930).

Summary

These studies have shown that where it is desired to produce a supply of food that will be available to pheasants and quail throughout the winter, corn is probably the only grain in which we can place complete confidence at present. Where fall and early winter foods for all birds are wanted, a mixture of small grains was found satisfactory, but cultivation without planting is probably the most economical method for the results obtained.

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